

Appl. No. 10/603,361
Reply to Office Action of 06/29/2006
Amdt. dated 09/26/2006

Attorney Docket No.: N1085-00089
TSMC 2002-0917

REMARKS

Claims 1-19 were previously pending in this application and each of claims 1-19 has been rejected. Claims 1, 2, 6, 7 and 17 are hereby amended. Claim 19 is cancelled. Applicants respectfully request re-examination, reconsideration and allowance of each of presently pending claims 1-18.

I. Rejections of Claims 1, 3-5, 9, 14-19 under 35 U.S.C. § 103

In the subject Office action, specifically in paragraph 2, claims 1, 3-5, 9 and 14-18 were rejected under 35 U.S.C § 103(a) as being unpatentable over Clark et al. (U.S. Pat. No. 6,767,793), hereinafter "Clark" in view of Achuthan et al. (U.S. Pat. No. 6,855,607), hereinafter "Achuthan". Applicants respectfully submit that these claim rejections are overcome for reasons set forth below.

The claims rejected under 35 U.S.C. § 103(a) include independent claims 1 and 17, the only remaining independent claims with claim 19 having been cancelled.

Currently amended, independent claim 1 recites the feature of:

planarizing the layer of gate electrode material to produce a substantially planar surface formed only of the gate electrode material disposed atop the semiconductor device and extending distally past each of the opposed sides, . . . the substantially planar surface having the same height at locations superjacent the semiconductor device and at locations distal the semiconductor device.

Currently amended, independent claim 17 recites the features of:

a multiple gate electrode on each of the opposed sides of the fin, the multiple gate electrode formed of a layer of gate electrode material and having a substantially planar surface disposed atop the gate dielectric film formed over the top of the fin and extending distally past each of the opposed sides of the fin; and

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a patterned mask on the planar surface of the multiple gate electrode, the patterned mask having a substantially uniform thickness and a substantially planar surface including over the fin.

Neither the Clark nor Achuthan references provide a gate electrode material of sufficient thickness to extend over the fin, i.e., the "semiconductor device" of claim 1 and the "fin" of claim 17 or feature 300 of Clark or fin 210 of Achuthan, to provide the claimed feature of the gate electrode material disposed over the semiconductor device/fin and having a (i.e. a singular) substantially planar surface that extends both over the semiconductor device/fin and extends distally past either side of the semiconductor device/fin to produce a singular substantially planar surface. Applicants note that in each of claim 1 and 17 "a substantially planar surface" is recited, and that such feature is distinguished from multiple planar surfaces such as exhibited in Achuthan.

To further highlight this distinguishing feature, claim 1 has also been amended to point out that the substantially planar surface has the same height at locations superjacent the semiconductor device and at locations distal the semiconductor device. Clark does not recite this feature because Clark does not include any semiconductor material formed over the semiconductor device and Achuthan does not disclose this feature because Achuthan provides three different planar surfaces: one atop the semiconductor fin 210, and the other two disposed lateral to the fin. The term distal is defined as "situated away from the centre of the body or an area or from the point of attachment. The opposite of proximal", in the Oxford Online Dictionary as viewed on September 4, 2006: <http://www.askoxford.com>. The substantially planar surface that

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extends above fin 210 in FIG. 4b of Achuthan, begins curving downward almost immediately at the lateral edges of the fin 210. At any rate, the planar surface above fin 210 of Achuthan clearly does not extend distally as in the claimed invention. Moreover, the planar surfaces disposed lateral to the fin 210 of Achuthan are at a height below the height of the planar surface disposed superjacent the fin 210. It is shown that they are spaced apart by distance l_4 and therefore not at the same height as in the claimed invention. Claim 1 is therefore distinguished from the Clark and Achuthan references.

Amended independent claim 17 also recites the feature of the planar surface being a (i.e. a single) planar surface and extending distally past each of the opposed sides of the fin. Moreover, the limitation in claim 17 of a patterned mask being disposed on the planar surface and the patterned mask having a substantially uniform thickness and a substantially planar surface including over the fin requires that the surface upon which the uniform thickness patterned mask is formed is also of uniform height over the semiconductor device, a feature not achievable in Achuthan because of the multiple planar surfaces having different heights, i.e., spaced apart by distance l_4 . Claim 17 is therefore also distinguished from the references of Clark and Achuthan. Dependent claims 2, 6 and 7 also recite this feature of the photoresist film (similar to the patterned mask) formed over the planar top surface, having uniform thickness and the same height, further distinguishing Applicants' invention.

Claims 3-5, 9 and 14-16 depend from claim 1 and claim 18 depends from claim 17 and these dependent claims are therefore similarly distinguished from the Clark and Achuthan references. The rejection of claims 1, 3-5, 9, and 14-19 under 35 U.S.C.

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§103(a) as being unpatentable over Clark in view of Achuthan, should therefore be withdrawn.

II. Rejections of Claims 2, 6-8, 17 under 35 U.S.C. § 103

In the subject Office action, specifically in paragraph 4, claims 2, 6-8 and 17 were rejected under 35 U.S.C § 103(a) as being unpatentable over Clark et al. (U.S. Pat. No. 6,767,793), in view of Achuthan et al. (U.S. Pat. No. 6,855,607), as applied to claims 1, 3-5, 9 and 14-19 and further in view of Kinsborn et al. (U.S. Pat. No. 4,432,132), hereinafter "Kinsborn". Applicants respectfully submit that these claim rejections are overcome for the reasons set forth below.

Claims 2, 6-8 and 17 are distinguished from Clark in view of Achuthan for reasons set forth above. The reference of Kinsborn has apparently been relied upon for providing applying a photoresist mask of substantially uniform thickness on the planar top surface of the gate electrode material, then patterning and etching. Kinsborn does not, however, provide the feature of a multiple gate electrode with a layer of gate electrode material extending over a semiconductor fin and having a planar top surface as discussed infra. In fact, Applicants do not believe that Kinsborn provides any multiple gate electrode, i.e., a layer of gate electrode material extending over a semiconductor fin. Since Kinsborn does not make up for the above-stated deficiencies of a combination of Clark and Achuthan, claims 1 and 17 and therefore also dependent claims 2 and 6-8, are also distinguished from the references of record, namely Clark, Achuthan and Kinsborn. As such, the rejection of claims 2, 6-8 and 17 under 35 U.S.C. §103(a) as being unpatentable over Clark in view of Achuthan and further in view of Kinsborn, should be withdrawn.

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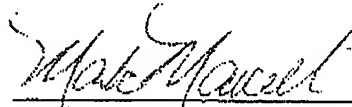
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CONCLUSION

Based on the foregoing, Applicants respectfully submit that each of claims 1-18 is in allowable form and the application is therefore in condition for allowance, which action is expeditiously and respectfully requested by Applicants.

The Assistant Commissioner for Patents is hereby authorized to charge any fees or credit any excess payment that may associated with this communication, to Deposit Account 04-1679.

Respectfully submitted,

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